

## CLAIMS

1. An isolated polypeptide molecule having at least about 80% identity with  
5 a) SEQ ID NOs.2, 4, 6, 8, 10, or 12; or  
b) an amino acid sequence encoded by the nucleic acid sequence of SEQ ID  
NO: 1, 3, 5, 7, 9, or 11;  
wherein the isolated polypeptide molecule allows fish to sense ion  
concentrations.
- 10 2. An isolated polypeptide molecule having at least about 90% identity with  
a) SEQ ID NOs.2, 4, 6, 8, 10, or 12; or  
b) an amino acid sequence encoded by the nucleic acid sequence of SEQ ID  
NO: 1, 3, 5, 7, 9, or 11;  
15 wherein the isolated polypeptide molecule allows fish to sense ion  
concentrations.
3. An isolated polypeptide molecule having at least about 80% identity with  
a) SEQ ID NOs.2, 4, 6, 8, 10, or 12; or  
20 b) an amino acid sequence encoded by the nucleic acid sequence of SEQ ID  
NO: 1, 3, 5, 7, 9, or 11;  
wherein the isolated polypeptide molecule assists fish in adapting to changing  
ion concentrations by altering water intake, water absorption or urine output.
- 25 4. An isolated polypeptide molecule having at least about 90% identity with  
a) SEQ ID NOs.2, 4, 6, 8, 10, or 12; or  
b) an amino acid sequence encoded by the nucleic acid sequence of SEQ ID  
NO: 1, 3, 5, 7, 9, or 11;

wherein the isolated polypeptide molecule assists fish in adapting to changing ion concentrations by altering water intake, water absorption or urine output.

5. An isolated polypeptide molecule having at least about 80% identity with
- 5 a) SEQ ID NOs.2, 4, 6, 8, 10, or 12; or
- b) an amino acid sequence encoded by the nucleic acid sequence of SEQ ID NO: 1, 3, 5, 7, 9, or 11;
- wherein the isolated polypeptide molecule allows a fish to modulate the percentage of total fat, protein and moisture of muscle.
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6. An isolated polypeptide molecule having at least about 90% identity with
- a) SEQ ID NOs.2, 4, 6, 8, 10, or 12; or
- b) an amino acid sequence encoded by the nucleic acid sequence of SEQ ID NO: 1, 3, 5, 7, 9, or 11;
- 15 wherein the isolated polypeptide molecule allows a fish to modulate the percentage of total fat, protein and moisture of muscle.
7. An isolated polypeptide molecule having an amino acid sequence that comprises:
- 20 a) SEQ ID NOs.2, 4, 6, 8, 10, or 12; or
- b) an amino acid sequence encoded by the nucleic acid sequence of SEQ ID NO: 1, 3, 5, 7, 9, or 11.

8. A polypeptide purified from a clone deposited under ATCC No.: 209602.
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9. An antibody that specifically binds to a polypeptide molecule having an amino acid sequence that comprises:

- a) SEQ ID NOs. 2, 4, 6, 8, 10, or 12; or
- b) an amino acid sequence encoded by the nucleic acid sequence of SEQ ID NO: 1, 3, 5, 7, 9, or 11.

10. A method of screening for Aquatic polyvalent cation-sensing receptor agonists and antagonists comprising measuring water reabsorption in isolated urinary bladder comprising the steps of:

- a) isolating flounder urinary bladder containing an Aquatic polyvalent cation-sensing receptor;
- b) weighing the isolated bladder to obtain a preexperiment weight;
- c) exposing the isolated bladder to a solution containing a test compound under conditions for a time sufficient for the test compound to agonize or antagonize the Aquatic polyvalent cation-sensing receptor present in the isolated bladder; and
- d) weighing the bladder after the experimental period to obtain a post-experiment weight, wherein the difference of pre and post experiment weights of the bladder are an indication of water reabsorption.